Health Consultation

Millcreek Fire

April 11, 2001

Prepared by
The Washington State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

Foreword

The Washington State Department of Health (DOH) has prepared this health consultation in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the U.S. Department of Health and Human Services and is the principal federal public health agency responsible for health issues related to hazardous waste. This health consultation was prepared in accordance with methodologies and guidelines developed by ATSDR.

The purpose of this health consultation is to identify and prevent harmful human health effects resulting from exposure to hazardous substances in the environment. The health consultation allows DOH to respond quickly to a request from concerned residents for health information on hazardous substances. It provides advice on specific public health issues. DOH evaluates sampling data collected from a hazardous waste site, determines whether exposures have occurred or could occur, reports any potential harmful effects, and recommends actions to protect public health.

For additional information or questions regarding DOH, ATSDR or the contents of this health consultation, please call the Health Advisor who prepared this document:

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Glossary

Agency for Toxic Substances and Disease Registry (ATSDR)	The principal federal public health agency involved with hazardous waste issues, responsible for preventing or reducing the harmful effects of exposure to hazardous substances on human health and quality of life. ATSDR is part of the U.S. Department of Health and Human Services.
Comparison value	A concentration of a chemical in soil, air or water that, if exceeded, requires further evaluation as a contaminant of potential health concern. The terms comparison value and screening level are often used synonymously.
Contaminant	Any chemical that exists in the environment or living organisms that is not normally found there.
Exposure	Contact with a chemical by swallowing, by breathing, or by direct contact (such as through the skin or eyes). Exposure may be short-term (acute) or long-term (chronic).
Groundwater	Water found underground that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater often occurs in quantities where it can be used for drinking water, irrigation, and other purposes.
Hazardous substance	Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.
No apparent public health hazard	Sites where human exposure to contaminated media is occurring or has occurred in the past, but the exposure is below a level of health hazard.
Route of exposure	The way in which a person my contact a chemical substance that includes ingestion, skin contact and breathing.

Background and Statement of Issues

The Washington State Department of Health (DOH) has prepared this health consultation at the request of the Snohomish Health District (SHD) to evaluate the potential human health risks for associated with residents living near a fire that occurred at a Millcreek business.

On May 9, 2000, a trailer from a semi truck caught fire in a parking lot at 1832 180th Street SE, Bothell, Washington (Figure 1).[1] The trailer contained hazardous waste, including sodium hydroxide, red phosphorous, iodine crystals, mercaptan liquid, hydrogen peroxide, nitric acid, mixed alkalines, corrosive and oxidizing liquids, and plastic empty containers. Water used by the fire department to control the fire entered parking lot storm drains, which lead to a biofiltration swale for storm water accumulation, and eventually overflowed to a ditch along 180th Street SE (Figure 2). The ditch and 180th Street slope downhill toward the east, such that the effluent migrated downhill for approximately 200 feet. The ditch is adjacent to a residential area and a park.

The Washington State Department of Ecology (Ecology) sampled surface water and sediment along the ditch, the biofiltration swale, the parking lot storm drains, and soil west of the parking lot for volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), gasoline, diesel, lube oil, and total metals (Figure 2). Environmental sampling results showed total chromium above comparison values (values established by ATSDR which are not necessarily a health concern, but require further evaluation).

On May 10, 2000, contaminated soil and sediment along the 180th Street ditch and in the biofiltration swale was excavated and disposed of. Follow-up environmental sampling showed heavy metals below ATSDR comparison values.

Discussion

It is important to identify and evaluate possible exposure pathways. An exposure pathway is the process by which an individual is exposed to contaminants that originate from a source of contamination. An exposure pathway consists of the following five elements: A source of contamination, an environmental media and transport mechanism, a point of exposure, a route of exposure, and a receptor population. An exposure pathway must include all five elements in order to link a contaminant source to a receptor population. Exposure pathways may occur in the form of inhalation, ingestion, or dermal absorption.

Ingestion and Dermal Absorption

Ecology sampled surface water and sediment along the 180th Street ditch, the biofiltration swale, the parking lot storm drains, and soil west of the parking lot, both prior to excavation and following excavation. Environmental sampling results prior to excavation determined that soil

and surface water was contaminated with heavy metals above comparison values. From the time of the spill until the time of excavation, there could have been an ingestion or dermal exposure pathway, but is unlikely since Ecology and cleanup contractors were on the scene, and residents were notified and asked to evacuate their homes.

Inhalation

There could have been an inhalation exposure pathway because of combustion of empty plastic containers and/or other hazardous materials; however, no air sampling was performed, consequently this pathway could not be evaluated. Assuming the major parent compound in the plastic materials was polyethylene, combusted byproducts at low temperature would have been hydrocarbons, while the major components at higher temperatures would have been composed of polycyclic aromatic hydrocarbons. Short-term exposure to these airborne byproducts could have caused headache, fatigue, or nausea. Exposure to the other hazardous materials on the truck trailer, either in the form of parents components or as combusted byproducts, could have caused lung irritation; however, the exposure would have been short-term as people were evacuated from their homes. In addition, there is no community-specific health outcome data to indicate that the site has had an adverse impact on human health.

Exposure Pathways and Children

The potential for exposure and associated adverse health effects are often increased for young children as opposed to older children or adults. Since the site is adjacent to a residential area and a park, children could venture near the site to play. Children are far more likely to engage in activities that involve getting dirty. Playing in dirt combined with frequent hand-to-mouth activity, provides toddlers and young children with an increased chance of exposure to contaminants by way of ingestion, inhalation, and skin contact. In addition to the potential for higher exposures of young children, the risk of adverse health effects is also increased. ATSDR and DOH recognize that children are susceptible to developmental toxicity that can occur at levels much lower than those causing other types of toxicity. Children living near the Millcreek Fire or the ditch along 180th Street were not likely to be exposed to contaminated materials in the ditch because of notification to evacuate homes near this area, and due to the presence of onsite clean-up consultants and Ecology personnel during cleanup.

Conclusions

1. No apparent public health hazard exists for children or adults exposed to contaminants in from sediments or surface water in the ditch along 180th Street. Current levels of hazardous substances, including heavy metals, do not exceed ATSDR comparison values. Data are available for applicable environmental media to which humans were being exposed prior to excavation, and there is no community specific health outcome data to indicate that the site has had an adverse impact.

2. No apparent public health hazard exists for children or adults from short-term inhalation exposure to airborne, combusted by-products from plastic containers or other hazardous substances. Although residents could have experienced lung irritation, the exposure would have been short-term as people were evacuated from their homes. There is no community specific health outcome data to indicate that the site has had an adverse impact.

Recommendations/Public Health Action Plan

Since the site has been cleaned up with confirmatory environmental sampling, there are no recommendations with respect to this site.

* Copies of this health consultation will be provided to Ecology and Circuit Engineering.

References

3. Letter to P. O=Brien, Ecology, from C. Mayer, Philip Services, May 12, 2000.

4. Memorandum to D. Davis from A. Johnson, May 19, 2000.

5. Natural Background Soil Metals Concentrations in Washington State, Toxics Cleanup Program Department of Ecology, October 1994.

Certification

This Millcreek Fire Health Consultation was prepared by the Washington State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

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The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

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